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09/736,736	12/14/2000	Robert Arthur Lee	CU-2418 TFP	8027

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Ladas & Parry
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EXAMINER

AMARI, ALESSANDRO V

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 06/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/736,736

Applicant(s)

LEE, ROBERT ARTHUR

Examiner

Alessandro V. Amari

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08 April 2003 has been entered.

Claim Objections

2. Applicant is advised that should claims 2-21 be found allowable, claims 23-42 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-20 and 22-41 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshitake et al. U.S. Patent 5,991,078.

In regard to claims 1 and 22, Yoshitake et al. discloses (see Figures 3-5) a diffractive device having a surface relief structure which, when illuminated by a light source, generates one or more diffraction images which are observable from particular ranges of viewing angles around the device as described in column 1, lines 53-68 and column 2, lines 1-57, including: a region of diffractive structural elements, the region having a length and a width as shown in Figures 3 and 5; background diffractive structural elements (B, B') distributed over the length of the region, a plurality of the background elements having a longitudinal extent which extends throughout the width of the region as shown in Figures 3 and 5; and a plurality of interstitial diffractive structural elements (A, A'); wherein each of the plurality of interstitial elements are interspersed at least partially longitudinally adjacent to one or more of the background elements within the region or wherein at least some of the plurality of interstitial elements are smoothly connected to one or more of the background elements within the region such that the diffractive action of the background elements is to be modulated by the interstitial elements, with differing interstitial element configuration in differing parts of the surface relief structure producing differing diffraction effects in corresponding parts of the diffraction images as described in column 6, lines 29-55. It should be noted that the definition of interstitial is "related to or situated in the interstices," an interstice being "a space that intervenes between things," (i.e., situated in a space that intervenes between things). (See Merriam-Webster's Collegiate Dictionary, 10th ed., 1999)

Art Unit: 2872

Therefore, it is clear that the diffractive structural element (A, A') meets the claimed recitation of an interstitial diffractive structural element.

Regarding claims 2 and 23, Yoshitake et al. discloses (see Figures 3, 5) that at least some of the background elements consist of a multiplicity of continuously connected individual ridge or groove segments, with ridge or groove segments in adjacent background elements being arranged in an approximately parallel configuration, and wherein at least some of the interstitial elements consist of individual or bifurcated ridge or groove segments interspersed between the background elements, with interstitial element ridge or groove segments being approximately parallel to ridge or groove segments in adjacent background elements as described in column 4, lines 1-5, column 7, lines 18-58 and as shown in Figure 5.

Regarding claim 3 and 24, Yoshitake et al. discloses (see Figures 3 and 5) that at least some of the background elements are approximately parallel, each consisting of a plurality of discontinuous individual ridge or groove segments, and wherein at least some of the interstitial elements are approximately parallel to each other, each consisting of one or more ridge or groove segments and each being located in a discontinuity in a background element as described column 7, lines 18-58 and as shown in Figures 3 and 5.

Regarding claim 4 and 25, Yoshitake et al. discloses that at least some of the interstitial elements are connected smoothly at each end to a background element as shown in Figure 5.

Regarding claim 5 and 26, Yoshitake et al. discloses that at least some of the interstitial elements are oriented generally at right-angles to the general orientation of the background elements as shown in Figure 3.

Regarding claim 6 and 27, Yoshitake et al. discloses (see Figures 3 and 5) that at least some of the interstitial elements are connected smoothly to adjacent interstitial elements and/or background elements in one or more of the following ways:

- ^{du} (a) a single interstitial element bifurcates smoothly into two interstitial elements;
- ^{du} (b) two interstitial elements join smoothly into a single interstitial element;
- ^{du} (c) an interstitial element joins smoothly into a background element;
- ^{du} (d) an interstitial element of a particular depth and width transitions smoothly into an interstitial element of a different depth and width;
- ^{du} (e) an interstitial element of a particular shape and/or curvature transitions smoothly into an interstitial element of a different shape and/or curvature;
- (f) an interstitial element with a particular angular orientation relative to the background elements joins smoothly to an interstitial element having a different angular orientation as described on column 3, lines 53-68, column 4, lines 1-13, column 7, lines 22-68 and column 8, lines 1-56.

Regarding claim 7 and 28, Yoshitake et al. discloses (see Figures 3 and 5) that at least some of the background elements are connected smoothly to adjacent background elements and/or interstitial elements in one or more of the following ways:

- ^{du} (a) a single background element bifurcates smoothly into two background elements;
- ^{du} (b) two background elements join smoothly into a single background element;

Art Unit: 2872

✓ (c) a background element joins smoothly into an interstitial element (as shown in Figures 8 and 10);

✓ (d) a background element of a particular depth and width transitions smoothly into a background element of a different depth and width;

✓ (e) a background element of a particular shape and/or curvature transitions smoothly into a background element of a different shape and/or curvature;

(f) a background element with a particular angular orientation relative to other background elements joins smoothly to a background element having a different angular orientation as described on column 3, lines 53-68, column 4, lines 1-13, column 7, lines 22-68 and column 8, lines 1-56 and as shown in Figures 3 and 5.

Regarding claim 8 and 29, Yoshitake et al. discloses (see Figures 3-5) that each of the background elements and the interstitial elements has a shape which includes one or more of the following features:

(a) a straight, curved or undulating groove;

(b) a straight, curved or undulating ridge;

(c) an array of dot-shaped indentations or protrusions; or

✓ (d) a polygonally shaped indentation or protrusion

as described in column 4, lines 1-5 and column 7, lines 22-68 and column 8, lines 1-56.

Regarding claim 9 and 30, Yoshitake et al. discloses (see Figures 3-5) that the diffraction effects observed in a particular part of the image are determined by the interstitial element configuration in a corresponding part of the surface relief structure,

Art Unit: 2872

and the interstitial element configuration features include one or more of the following features:

- (a) lengths of interstitial elements;
- (b) widths of interstitial elements;
- (c) depths and/or heights of interstitial elements;
- (d) local spatial frequency of interstitial elements;
- (e) degree of curvature of interstitial elements;
- (f) shape of interstitial elements; and
- (g) shapes of joins between adjacent interstitial elements

as described in column 7, lines 22-68 and column 8, lines 1-15.

Regarding claim 10 and 31, Yoshitake et al. discloses that between background elements interstitial elements vary continuously in terms of orientation, curvature, thickness and/or shape, the variations being a means by which image information is encoded into the surface relief structure as described in column 7, lines 22-68 and column 8, lines 1-15.

Regarding claim 11 and 32, Yoshitake et al. discloses that at least some of the interstitial elements are oriented generally parallel to the background elements as shown in Figure 5.

Regarding claim 12 and 33, Yoshitake et al. discloses (see Figure 3) that at least some of the interstitial elements (14) are arranged in a comb-like configuration, with the teeth of the comb being oriented at right angles or at an angle oblique to the general orientation of the background elements (15) as shown in Figure 3.

Regarding claim 13 and 34, Yoshitake et al. discloses (see Figure 3) that at least some of the interstitial elements are arranged in groups oriented at right angles or obliquely to the general orientation of the background elements, such that a cross-section through the group has a periodic or sinusoidal shape of many repeating periods or oscillations as described in column 6, lines 1-63 and column 7, lines 22-58.

Regarding claim 14 and 35, Yoshitake et al. discloses that at least some interstitial element configurations are designed to create grey-scale or variable image intensity information in the image, and one or more of the following configuration features give rise to the grey-scale or variable image intensity information:

- (a) lengths of interstitial elements;
- (b) degree of curvature of interstitial elements;
- (c) widths of interstitial elements and shapes of joins between adjacent elements;
- (d) local slope or angle of interstitial elements

as described in column 4, lines 11-13, column 7, lines 22-67 and column 8, lines 1-15.

Regarding claim 15 and 36, Yoshitake et al. discloses that at least some interstitial element configurations are designed to create colour information in the image as described in column 4, lines 4-10, column 8, lines 10-16, 57-63.

Regarding claim 16 and 37, Yoshitake et al. discloses (see Figures 3 and 5) that the background elements include one or more of the following configurations:

- (a) straight, equally spaced background elements;
- (b) straight, variably spaced background elements;
- (c) undulating, equally spaced background elements;

Art Unit: 2872

- (d) undulating, variably spaced background elements;
- (e) equally spaced closed or open elliptically shaped background elements;
- (f) variably spaced closed or open elliptically shaped background elements;
- (g) zig-zag shaped background elements of variable zig or zag angle as shown in Figures 3 and 5.

Regarding claim 17 and 38, Yoshitake et al. discloses that the surface relief structure generates two or more diffraction images which are observable from different ranges of viewing angles, wherein some regions of the surface relief structure contribute to one of the images, and other regions contribute to another of the images as described in column 6, lines 9-63.

Regarding claim 18 and 39, Yoshitake et al discloses that at least some of the interstitial elements have lengths of less than 0.25mm as described in column 10, lines 1-15.

Regarding claim 19 and 40, Yoshitake et al discloses that the background elements have lengths of greater than 0.25mm as described in column 10, lines 1-15.

Regarding claim 20 and 41, Yoshitake et al. discloses that the surface relief structure includes between background elements one or more of the following:

- (a) small scale text or graphics indented into or protruding from the surface relief structure;
- (b) interstitial elements consisting of parallelograms of varying angular orientations indented into the surface relief structure;
- (c) diffusely reflecting randomly distributed interstitial elements;
- (d) diffusely reflecting trapezoidal interstitial elements

as described in column 4, lines 1-5 and column 8, lines 36-56.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 21 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshitake et al U.S. Patent 5,991,078 in view of Staub et al U.S. Patent 6,359,734.

Regarding claims 21 and 42, Yoshitake teaches the invention as set forth above but does not teach that machine-readable digital information is encoded into the positioning, length, orientation and/or other physical characteristics of interstitial elements, such that the information may be read by passing a laser over the interstitial elements and analysing and decoding the reflected light.

Regarding claims 21 and 42, Staub et al does teach that machine-readable digital information is encoded into the positioning, length, orientation and/or other physical characteristics of interstitial elements, such that the information may be read by passing a laser over the interstitial elements and analysing and decoding the reflected light as described in column 5, lines 16-67 and column 6, lines 1-14.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to encode machine-readable information into the positioning, length, orientation and/or other physical characteristics of diffractive elements as taught by Staub et al in the diffractive device of Yoshitake et al in order to provide for additional security features for authenticity purposes.

Response to Arguments

7. Applicant's arguments filed 08 April 2003 have been fully considered but they are not persuasive.

The Applicant argues that while Yoshitake describes a device having diffraction gratings, it fails to teach or disclose all of the elements claimed. In particular, in the diffraction gratings in Yoshitake et al, the proposed interstitial elements A and A' are centrally located as a group within a second set of diffraction gratings, proposed background elements B and B'. The Applicant further asserts that each of the alleged interstitial elements of Yoshitake et al is not "interspersed at least partially longitudinally adjacent to one or more background elements" as claimed. Instead, most of the diffraction gratings are adjacent to other gratings of the same type and not longitudinally adjacent to the background element.

In response to this argument, the Applicant is reminded that the claim rejection is based upon the claim recitation and that the claims are given the broadest reasonable interpretation consistent with the specification. The specification describes the background elements as consisting "of a multiplicity of continuously connected individual ridge or groove segments" and that the interstitial elements consist "of individual or bifurcated ridge or groove segments interspersed between the background elements" (see specification, page 4, lines 24-31). An examination of Figures 3 and 5 of Yoshitake clearly shows that Yoshitake meets the claimed limitations as interpreted consistent with the specification. Figures 3 and 5, for example show a region of diffractive structural elements having a width and a length wherein background

Art Unit: 2872

diffractive structural elements B and B' are clearly a multiplicity of continuously connected individual ridge or groove segments as described in the Applicant's disclosure. Furthermore, Figures 3 and 5, show interstitial diffractive structural elements A and A' which consist of individual ridge or groove segments interspersed between the background elements in harmony with the specification. The definition of intersperse is defined as "to place something at intervals in or among" (See Merriam-Webster's Collegiate Dictionary, 10th ed., 1999) so it is clear that the interstitial diffractive structural elements A and A' are placed at intervals in or among the background elements. For the sake of clarity, the Examiner has included an annotated version of Figure 5 of Yoshitake to further show how the claims are being interpreted.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (703) 306-0533. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on (703) 308-1687. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Application/Control Number: 09/736,736

Page 13

Art Unit: 2872

avaa *la*

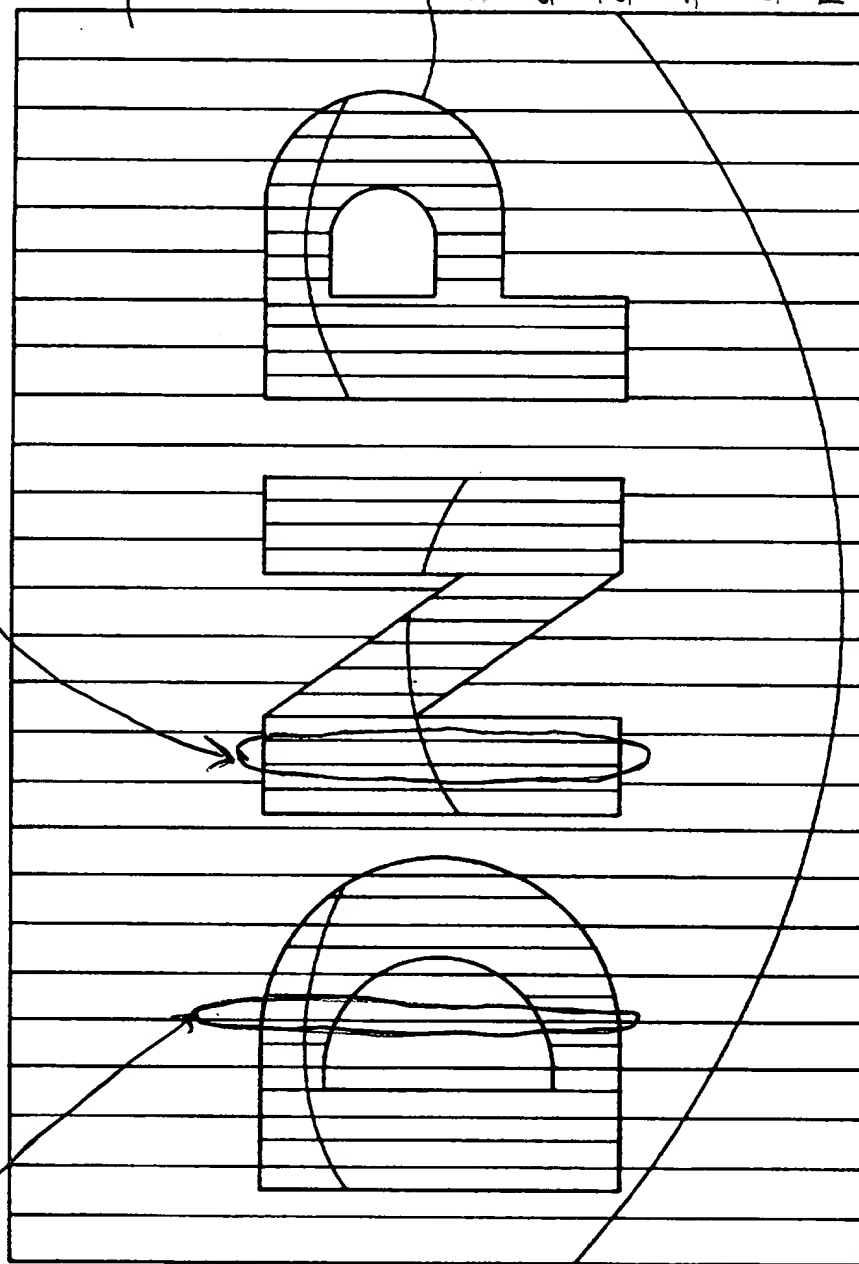
May 29, 2003


MARK A. ROBINSON
PRIMARY EXAMINER

interstitial elements
interposed between
background elements.

FIG. 5

one or more interstitial elements
are smoothly connected to one or more
background elements within the region



B' Background elements having a
longitudinal extent through
width of region

A'

plurality of interstitial

diffusive structural

elements wherein each of

the plurality of interstitial elements

are interposed at least

partially longitudinally

adjacent to one or

more of the

background elements

A region of diffusive structural elements having a length and a width